METEOROLOGICAL OFFICE

NEWSLETTER FOR CLIMATOLOGICAL OBSERVERS IN ENGLAND AND WALES

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FOR

CLIMATOLOGICAL OBSERVERS

IN

ENGLAND AND WALES

NO 14

MARCH 1985

Produced by:

Met O1
Observational Requirements
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Bracknell
Berkshire
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OBSERVERS NEWSLETTER MARCH 1985

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EDITORIAL

Welcome to another edition of the Climatological Newsletter. Recently there have been many new faces, including mine, appearing in the corridors of Met O 1. Mike Longworth my predecessor is probably sunning himself following his posting to Vanuatu, a small island in the Pacific Ocean. Some people have all the luck.

In this edition we continue the article by Mr G W Bryant on Archiving and Quality Control of Climatological Data. Also included is an article on the Initial Processing of Climatological Data which gives some useful guidance on the completion of the monthly return form Metform 3208B.

It gives me great pleasure to welcome four new stations who have recently joined the co-operating network. I hope this will be the beginning of many years of mutual co-operation.

My apologies to all those observers who could not be found places on one of the four Climatological Observers courses to be held during 1985. The demand for places has been so great that unfortunately some applicants were disappointed. However, a note has been made of those who were not successful this year and places will be available for them, if requested, on future courses.

Finally some information about myself. I joined the Office in 1967 and started work in our Cloud Physics Research Department. After 11 years with my head in the clouds my feet were firmly placed on the ground in the Agricultural Department. Whilst there I was involved in modelling airborne disease spread from animals. In 1983 I was once again uprooted and transported to the Personnel Department. With Mikes departure to Vanuatu I have recently joined Met O1e and I look forward to visiting and meeting as many of you as possible.

J Gloster

RETIREMENT OF MRS D ALLEN

As most of you will know Mrs Allen retired in early December after forty-two years in the Meteorological Office. During the past eleven years she has helped in the running of the climatological network. She asked us to pass on her thanks, via the Newsletter, for all the letters, cards and messages she received on her retirement from people she knew in the co-operating network.

HQ NEWS

Recently the work of the Climatological, Agricultural/Hydrometeorological Branches have been reviewed and this will lead to changes in workload and function of these departments at Bracknell. These will be described in the next issue.

STATION DETAILS

May we take this opportunity to remind all our stations that we would appreciate details of any changes which may take place at your station. Please inform Met O 1e (Climat) of any changes, for instance any plans for station closure, change of site for enclosure, change of station address/telephone number, change of observer or details of any new construction which might adversely affect the exposure of instruments.

The address for such correspondence is:

Meteorological Office
Met O 1e, Climat
HQ Annexe
Eastern Road
Bracknell
Berks RG12 2UR

Or if you prefer please telephone Bracknell (0344) 420242 Ext 2266/2727.

THE THIRD EXTRACT FROM MR G W BRYANT'S ARTICLE ARCHIVING AND QUALITY CONTROL OF CLIMATOLOGICAL DATA REPRODUCED FROM THE METEOROLOGICAL MAGAZINE, 108, 1979 pp309-315

(c) Internal quality control

The transfer of data to the main data-sets is completed before quality control begins. There is, however, a preliminary format check carried out during the transfer which examines each line of data for errors such as illegal characters, invalid overpunches, embedded blanks or characters in the wrong field. The data should be mostly numerical, so this type of error suggests serious corruption of that line of data and the entire line if printed out for inspection and re-keying.

Errors in format are relatively rare and so the main quality control process is part of the same program and begins after transfer of the data but before any corrections are made. The first step in the main process, carried out only for 09 GMT and daily data, consists of a check for missing data and the computation of totals and means and statistics such as the number of days with rainfall or air frost. Subsequently these statistics can be compared with the values entered on the original form.

The next step, which varies with the type of data, involves a large series of tests. The first and simplest of these requires that the values of the various elements should fall within a valid range. For most elements, the ranges are constant but for temperature and sunshine they are made to vary with the month; the possibility of making them a function of latitude is being investigated. The second type of check involves an examination of internal consistency of observations, and this is rather more complex in that it ensures that the parameters observed at a particular hour are consistent with each other. For example, dry-bulb temperature should not be less than wet-bulb temperature and the amount, type and height of low, medium and high cloud should all be mutually consistent. A wide range of checks can be applied to the data using the past and present weather codes in the hourly and fixed hourly observations.

This step concludes with time sequence checks which are mainly used with hourly and fixed hourly data and ensure that each value of temperature, pressure, wind speed and wind direction is consistent with the preceding and subsequent values. This test is of limited use because it assumes that the element concerned should change by only a relatively small amount between successive measurements. Consequently, its use with daily data is confined to soil and earth temperatures.

This program generates queries at a rate of about 10 000 per month and these are passed back to the quality control scrutineers, each of whom has responsibility for checking the data for a particular area containing up to 100 stations. Checking begins with a comparison between the queried values and those entered by the observer on the manuscript form; this eliminates keying errors missed by verification. If the keyed value agrees with that on the form then the data must be examined more closely. The interrelationship between various elements often makes it fairly easy to judge the validity of a query and to calculate the correct values. (A typical example would be cloud type reported as cirrus but cloud height coded as 020 (2000ft) instead of 200 (20 000ft)). Each of the scrutineers specializes in a particular group of stations and this allows them to become acquainted with local effects. In doubtful cases, the observer is contacted to compare the queried value with that in the observing station's register; in such a situation, the observer's decision is usually accepted.

The computer print-out lists with each query an immediately keyable error message consisting of the indicatives including date and (if applicable) hour, a mnemonic for the type of element being queried and a code giving the reason for the query. With the addition of the correct value, this message then contains all the information necessary for the corrections to be made, and the further addition of a standard marker causes an entry to a quality control data-set. A batch of such messages can then pass through the keying section to the computer in much the same way as the original climatological data.

About 50 per cent of the queries raised by the computer quality control are rejected at this stage as spurious, and require no further action. Of the remainder, about 40 per cent of the queries are accepted and are due to keying or transcription errors. The remaining 10 per cent fall into a different category where, although there is a firm belief in the validity of a new value, there remains a slight possibility that the original value may have been correct. It is a World Meteorological Organization requirement, in this situation, that both the old value and the reason for the change should be preserved. The quality control data-set, referred to earlier, was therefore created to hold this information.

When the corrections have been made, the only step remaining in this intermediate stage is to re-run the quality control checks to ensure that the corrected values and the rest of the data are mutually consistent. Throughout the month, therefore, all incoming data are processed in this way to build up data-sets which are relatively error-free.

(To Be Continued)

FIELD STUDY COURSES - SUMMER 1985

Each year the Royal Meteorological Society and the Field Studies Council sponser together two courses aimed at the interested amateur or layman who wants to find out more about the weather.

The courses contain talks and films on such topics as "Why it rains" and "Satellites in Meteorology"; tuition on understanding and drawing up weather charts and using them to make forecasts; whilst outdoors, routine observations are made and experiments such as tracking weather balloons are tackled. No previous knowledge of meteorology is assumed.

"Understanding Weather" directed by Dr Keith Weston of the University of Edinburgh and Dr David Warren, British Antarctic Survey will run from the 9-16 August 1985. The fee for this course is £119 and is held at Malham Tarn Field Centre, 1300 ft up in the Yorkshire Dales. "Weather Science and Weather Forecasting" is directed by Dr Bob Riddaway, Meteorological Office and Dr Geoff Jenkins, Department of the Environment from 21-28 August 1985 at the Nettlecombe Court Field Centre, a beautiful old country house in the Exmoor National Park. The cost of this course is £123. Prices quoted for these courses includes full board at the Field Centre.

There are four other courses run by the Royal Meteorological Society concerned with weather and particular outdoor activities - Sailing; Hill Walking; Mountain Climbing and Birdwatching.

Full details of any of these courses may be obtained by writing (or telephoning) the Executive Secretary, Royal Meteorological Society, James Glaisher House, Grenville Place, Bracknell, Berkshire, RG12 1BX (Bracknell (0344) - 422957).

AWARDS TO OBSERVERS

The Meteorological Office decided in 1982 to recognise those long standing observers who have maintained daily observations and submitted monthly returns of good quality with a book award. Additionally, a special award of a barograph is made to a limited number of climatological observers after exceptional service.

The observers listed below all received a book award in 1984 in addition to those already mentioned in the October 1984 Newsletter.

OBSERVER	STATION	PERIOD OF SERVICE
J BONNER	Aylesbury (Bucks)	25 Years
H EDWARDS	Penmaen (Glamorgan)	22 Years
J CROFT	Rothamstead (Herts)	20 Years
C FEAR	Rodney Stoke (Somerset)	20 Years

One observer in Scotland has also been presented with a book award.

NEWS OF STATIONS

STATION CLOSURES

The ago-met station at Letcombe Regis (Berkshire) which has been part of the climatological network since 1961 has closed following the decision by the Agricultural and Food Research Council to close its laboratory at Letcombe.

We are sorry to report the closure of the climatological station at Sheffield (Dore) run by Mr S T Whitaker. Mr Whitaker started his co-operation in 1958 and set up several stations before settling at Dore. In recognition of the quality and longevity of Mr Whitaker's observations he was awarded the University Atlas in 1983.

Two Water Authority stations have closed in the last six months. They are Ladock (Cornwall) run by South West Water and the Welsh Water Authority station at Llyn Alaw (Anglesey).

Due to a reorganisation within the Forestry Commission the climatological station at Stonehaugh (Northumberland) has now closed.

We are also sorry to lose the Health Resort station at Exmouth (Devon) which has had data published in the Monthly Weather Report since 1913.

STATION OPENINGS

We are very pleased to welcome four new stations into the climatological network. They are Beaminster (Dorset) privately run, Bronwydd-Mawr (Powys) a Welsh Plant Breeding Station, Weston Super Mare (Avon) set up at Priory School, Worle and Herne Bay (Kent) maintained by Canterbury City Council. In addition to these new stations we welcome South Shields (Tyne & Wear) into the climatological network. Maintained by the Port of Tyne Authority this was formerly an anemograph only station but has recently been upgraded to a climatological/anemograph station.

INITIAL PROCESSING OF CLIMATOLOGICAL DATA

Climatological observations are needed to enable the climate of the United Kingdom to be determined and monitored and to serve as a National Weather Diary. The importance of applied climatology to the national economy is very great and sound advice in this field can stem only from a sufficiency of reliable data.

Each month approximately 3 million items of climatological data are acquired and processed; anything which can be done to reduce the effort involved in processing these data is always very much appreciated.

First on the list must come the clarity of handwriting; this is particularly important during the process of converting the data into machine readable form. This conversion process is performed by the highly skilled ladies in the Processor Controlled Keying (PCK) installation who key the data onto disk ready for subsequent processing. The rate at which the data are keyed is measured in "key depressions per hour", ie how many keys an operator uses per hour, the figure having a built in allowance for functions such as turning pages over, rest periods etc. The basic rate of keying is 11000 key depressions per hour, practically all the ladies have achieved the proficiency rating of 16000 key depressions per hour (on which their pay is based) and the best operators achieve a figure of around 23000 key depressions per hour. At these speeds the ladies do not have time to assimilate what they are keying, they merely key what they see. They have no time to stop and inspect the form to decide whether, for example, that figures should be a 1 or a 7, a 6 or a 0. Clarity of handwriting is therefore very important.

If you do make a mistake when completing the return it is perfectly alright to use Tipp-Ex or other similar product rather than crossing out the erroneous figures and squeezing in the correct values above them. It is because of mistakes when completing the returns that we do not like the continental 7; is it a 7 or is it a 1 that has been crossed out.

Secondly is the preamble on the return - the station number, month etc. It is not unknown for returns to arrive with all the preamble and headings blank giving no indication of where the return is from! A quick check to see that these have been filled in would be appreciated.

The number of elements observed varies enormously between stations; some stations observe them all, others only a few. Having a multiplicity of returns to suit individual stations is obviously impractical; there are therefore usually some columns which are not completed. If the columns concerned, eg concrete minimum, are already blank then there is no problem and they can be left just as they are; it is the columns which have feint grey zeroes printed in them that sometimes cause difficulties. The printing of the feint grey zeroes is very much a two edged sword. On the one hand it relieves the observer from the chore of repeatedly entering zeroes when, for example, there is no rainfall or snow; on the other, if that element is not observed, leaving the zeroes in gives false information. Since the majority of stations do observe snow depth, rainfall and Weather we have decided to include the zeroes. We do ask, however, that if Snow Depth (columns 55-57), Rainfall (columns 58-61) or Weather (columns 69-72) are not observed then the feint grey zeroes are crossed through, preferably by drawing a vertical line down through the middle of the appropriate columns.

The throwing back of values often causes confusion, even to Met Office staff! If all observations were done at midnight then there would be no need for throwing back; obviously this is not practical hence the throwing back "rules". When read at 0900 GMT the maximum temperature value is entered against "yesterdays" date (ie thrown back) because the highest temperature for the 24 hours ending at 0900 GMT on the day of reading is most likely to have been reached the previous afternoon, eg a maximum temperature value of 23.6 read at 0900 GMT on the 6th of the month would be entered on the return against day 5. Similarly for Rainfall (and Run of Wind); it is likely that (most of) the rainfall fell in the 15 hours between 0900 and midnight rather than in the 9 hours from midnight to 0900. The rainfall total read on say the 10th of the month is therefore entered (or credited) on the return against the 9th. Minimum temperature values

are not thrown back since the minimum value for the 24 hour period ending at 0900 GMT on the day of reading is most likely to have occurred around dawn on that day, eg a minimum temperature value read on the 5th of the month is entered on the return against the 5th.

There are obviously occasions when the principle of "throwing back" breaks down, eg when it rains between midnight and 0900 GMT but not before. These occasions are, however, in the minority and it is important that everyone follows the same rules so that comparisons between stations can be made.

Many stations change their sunshine cards during daylight, typically at 0900 GMT (or at 6 pm for the Health Resorts). The sunshine duration on the return refers to a calendar day not a "sunshine card day". For example for sunshine cards changed at 0900 GMT:

Calendar day 1	Calendar day 2	Calendar day 3
Dawn.....0900.....Dusk	Dawn.....0900.....Dusk	Dawn.....0900.....Dusk
< 9 hrs >	< 1 hr)< 7 hrs >	< 2 hrs >
Same sunshine card used		Same sunshine card used

the value entered on the return for day 2 should be 8 hours.

Forgetting to reset the maximum and minimum thermometers is all too easy, especially when time is short (why does the telephone always ring at observation time). Sometimes one will "get away with it", eg if it is warmer after lunch than yesterday afternoon, but the crunch will come eventually. Read and reset is the rule. If you do forget and don't realise until the next days observations still enter the value on the return but put a comment in the remarks box.

Finally what we call "Mk 1 Eyeball Quality Control". Compare todays values with yesterdays; sometimes the values will be significantly different but often they are not, especially for items such as soil temperatures. When

the return is completed please scan your eye up and down the columns; simple transcription errors are easy to make.

If you do have any queries then please do not hesitate to contact someone (a list of names and telephone numbers appears elsewhere); we will be only too happy to hear from you.

John Bradford
Met O 3a
February 1985

VISITS TO BRACKNELL

If you find yourself in the Bracknell area, eg on holiday or business, and would like to visit us then please feel free to do so - you would be most welcome. Although not essential a quick phone call beforehand would be useful; we can then warn the Reception staff to expect you and can ensure that someone will be available to look after you. Please ring Met O1e (Climat) on Bracknell (0344) 420242 ext 2266 or 2727.

BRACKNELL HEADQUARTERS BRANCHES

Branch: Met O 1 - Observational Requirements And Practices

Section: e

Function: - Queries on running of meteorological station
- Supplies of stationary, forms, equipment, pocket registers
- Site changes

Staff: Mr Elwyn Edwards
Mr Richard Brooks

Address: Met O 1e
Eastern Road
Bracknell
Berkshire
RG12 2UR

Telephone: Bracknell 420242 extensions 2727 or 2266

Branch: Met O 3 - Advisory Services

Section: a

Function: Collection and Quality Control Of Climatological Data

Staff: Mr Steve Fowler plus 3 assistants - Miss Jenni Clarke, Mr Jan Lewandowski and Mr Pat Welham

Address: Met O 3a
London Road
Bracknell
Berkshire
RG12 2SZ

Telephone: Bracknell 420242 extensions 2271 or 2409

Other Useful Sections

Climatological Enquiries - Met O 3b
Tel: Bracknell 420242 extension 2278

WEATHER IN THE UNITED KINGDOM JULY-DECEMBER 1984

The mainly dry weather, which had started in February, continued until early September. But except over much of Scotland and Western parts of the United Kingdom rainfall deficiencies from February to August were less than in 1976. In Cardiff the period was the driest in more than 100 years of records while Bidston, Merseyside, reported its driest July since 1870. The main interruptions to the fine weather in the summer occurred between 9 and 15 July and from 23 July to 7 August, but except early in August much of the rainfall was insignificant. On 23 July, however, hailstones, up to 2 cm in diameter, fell in the Bracknell and Wokingham areas of Berkshire, with Easthampstead recording 43 mm of rain in 48 minutes, while early on the 25th severe storms over West Sussex and the south-east of Hampshire gave 91.5 mm at Hayling Island. Early August falls included 68.2 mm at Lathom Park, Lancashire, and 56.3 mm at Driby, Lincolnshire, on the 2nd and 57.7 mm at Terrington St Clement, Norfolk, on the 4th. While July was not as exceptionally hot as in 1983 August was about as warm and both months equally sunny overall as last year. Among the highest temperatures in July were 31.1 °C at Prestatyn, Clwyd, on the 8th and 31.5 °C at Oxford on the 28th, while in August 31.9 °C was recorded at St Helier, Jersey, on the 20th and 30.3 °C at Wellesbourne, Warwickshire, on the 21st. Nevertheless, there was ground frost in places on a few occasions, mainly early in July, and on the 3rd the air temperature fell to -1.5 °C at St Harmon, Powys.

The end of the long dry period was followed, as in 1976, by a very wet autumn and over Scotland, in a series of general values starting in 1879, only in 1981 and 1982 has the total rainfall from September to November been higher. Although 3 September was wet in the west and north, with 64.0 mm of rain falling at High Mowthorpe, North Yorkshire, heavy rainfall did not become general until the second half of the month. The most persistent spell of wet weather commenced on 17 October with 58.5 mm being recorded at Slapton, Devon, on the 22nd and 84.4 mm at Kielder Castle, Northumberland, and 51.9 mm at Princetown, Devon, on 3 and 21 November, respectively. However, eastern and central districts were mostly dry for a week from 25 October. The unsettled weather continued for much of December although rainfall amounts were smaller, generally, than hitherto and southern and central areas were mainly dry between the 6th and 12th. During the second half of the month the precipitation was occasionally wintry, mostly over the higher ground in the west and north, with 9 cm of snow lying at Malham Tarn, North Yorkshire, on the 18th and about 5 cm in parts of Wales and Wiltshire on the 27th. Although temperatures were mainly below normal in September they were mostly above thereafter with November being particularly mild in the south-east. There was little frost until December and even then much of it was slight. However, September had started very warm with temperatures reaching 26.8 °C at Morley St Botolph on the 1st and 29.1 °C at St Helier on the 2nd. Other maxima of note included 21.5 °C at Warsop, Nottinghamshire, on 8 October, 19.2 °C at Enfield, London, on 1 November and 15.4 °C at Aber, Gwynedd, and Melbury, Devon, on 22 and 23 December, respectively. Among the lowest minima were -0.5 °C at Bastreet, Cornwall, on 7 September, -5.5 °C at Santon Downham, Norfolk, on 27 October and at Loggerheads, Clwyd, on 16 November, and -8.6 °C at Redesdale, Northumberland, on 27 December. While September and November were generally rather dull, sunshine was near average over England and Wales in October and December was quite sunny, particularly in the Midlands and East Anglia.

Correction to last sentence of January to June 1984. March was the dullest since 1964, not 1942. The latter was, in fact, rather less dull.